

C. H. GILBERT CRUISE 74, August 1964

This cruise was designed to study the fish species present in ocean currents at this time of year. The fish were to be found by observing bird flocks, especially terns, which seem to follow fish schools more closely. Dayle Husted (S. I. personnel) boarded ship at Kaileua, Hawaii, August 14, 1964. The cruise covered the area around Hawaii, north of the Hawaiian chain to Kauai, the channel between Kauai and Niihau, and northwestward to south of Nihoa, then back to Honolulu on August 23. Dayle Husted was to observe the feeding behavior of the birds of the various flocks.

FEEDING BEHAVIOR OF BIRDS IN FLOCKS

Wedge-tailed Shearwater

Wedgetails were observed feeding in two major ways - either sitting on the water and dabbling or flying above the water and diving into the water. When sitting on the water they keep the wings folded, paddle around and put their head and neck under water to feed. When flying above the water, they dive to just above the water and put their head and neck under the water. During this action their wings are continuously beating. After sitting on the water they take off by lifting their heads out of the water and run along the surface until becoming airborne. The dives were not very deep-- probably less than a foot-- and lasted 3 or 4 seconds or less. Some Wedgetails were observed to alight on the water, keep their wings beating, or raised above their bodies, thrust the head and neck under water, and then take flight after a short run.

Newell's Shearwater

Only one flock of Newell's was observed feeding. These birds fed in similar fashion to the Wedgetail, but between dives to the water they do not arc up as high between dives to the water. Most of the arcs observed were under 15 feet above water level. They also turned on their sides more often, similar to Petrel flight. Newell's is also more maneuverable than the Wedgetail. When it dives down to the water it keeps its wings beating, puts its head and neck under water, then takes off with a much shorter run than a Wedgetail, or almost no run at all. No Newell's were observed sitting in the water in this particular flock, but they were observed sitting in the water singly or in pairs.

Noddy Tern

In the flocks observed, Noddy Terns stayed low to the water, usually 8 feet at the highest. When feeding they dove to just above the water and hovered above it. With wings beating continually, they put their heads into the water to feed. They then rose almost vertically above the water. Noddy Terns were also observed sitting on the water just dabbling around. Noddy Terns also followed along behind the ship as bait was being thrown out. The Noddies would grab the bait almost as soon as it hit the water. Noddy Terns were more maneuverable than the Shearwaters.

Hawaiian Noddy Tern

Hawaiian Noddies fed almost identically like Common Noddies. They stayed low to the water and were also very maneuverable. Both occurred in the same flocks and from a distance it was very difficult to distinguish the two species.

Blue-gray Nooddy

Blue-gray Noddies, nearly all immatures, were observed in one flock. Blue-grays occurred with both Hawaiian and Common Noddies. They stayed low to the water, were very maneuverable and seemed to have faster wing beats than the other Noddies, but that may be due to their smaller size. They seemed to be able to hover above the water but their wings were beating all the time. The Blue-grays were observed to put their heads or only their bills into the water. None were observed sitting on the water.

Sooty Tern

Sooties were observed to stay above the other terns and often above the Shearwaters. They would then drop down to feed like the Noddies. No Sooties were observed sitting on the water. After they had eaten they would rise back above the other birds. The process of going down to the water and then rising back up was repeated many times by the birds while they were being observed.

Fairy Tern

In the flocks observed, Fairy Terns fed like Sooty Terns, staying above the other birds and then dropping down to feed and then rising again. Fairy Terns were also observed flying low to the water but not in flocks. No birds were observed sitting on the water.

Brown Booby

Brown Boobies were observed to sit on the water and dabble around. They also swooped around over the water with both low and high arcs. When a fish or other food was spotted they seemed to collapse in mid air and dove straight into the water.

Red-footed Booby

Red-foots were observed to feed almost exactly like Browns. They both sat on the water and dabbled and also flew over the water until a fish or other food was spotted and then dove almost vertically into the water.

Feeding Flock Structure

In the flocks observed, each species seemed to consistently occupy the same position within the flock. Frigatebirds for example stayed above the main feeding flock -- often 200 yards above the flock. In one flock frigates were observed to come down to the level of the other species. Sooty and Fairy Terns stayed above the flock but were constantly diving down to the water and coming back up above the other birds. Common, Hawaiian and Blue-gray Noddies stayed just above the water surface following the fish school very closely. Wedge-tailed and Newell's Shearwaters were observed to follow the action of the terns but also flew around the area, neither staying up with the terns nor the fish school. Both species of booby flew all over the area; sometimes flying up with the Sooty and Fairy Terns; other times flying lower with the various Noddies.

TABLE I

<u>Date</u>	<u>Total Sightings</u>	<u>Total Birds</u>	<u>Birds/ Sighting</u>	<u>Total Flocks</u>	<u>Total Birds in Flocks</u>
Aug. 14	24	73	3.04	1	50
	31	45	1.45	0	0
	56	455	8.13	14	363
	94	1643	16.62	18	117 ⁴ 7
	0	0	0.0	0	0
	132	1591	12.05	15	1266
	8	25	3.13	0	0
	165	994	5.72	10	674
	94	4908	52.21	2	3366
	36	131	3.64	2	58
Total	640	9865		62	6954
Aver.	64	986.5	15.41	6.2	695.4

TABLE II

Species	Day (Aug.)										Total Species
	14	15	16	17	18*	19	20	21	22	23**	
Wedgetailed Shearwater	56	22	120	588	0	825	12	390	1294	73	3380
Newell's Shearwater	0	0	0	0	0	14	0	106	0	3	123
Christmas I. Shearwater	0	0	0	1	0	0	0	0	0	0	1
Bulwer's Petrel	14	2	22	3	0	3	0	13	532	0	589
Bonin I. Petrel	0	0	3	2	0	0	0	5	0	3	13
Dark-rumped Petrel	0	5	0	1	0	0	0	1	0	0	7
White-necked Petrel	0	0	1	0	0	0	0	0	0	0	1
Harcourt's Storm Petrel	0	0	0	0	0	4	0	9	0	0	13
Sooty Storm Petrel	0	0	0	0	0	0	0	0	13	0	13
Petrel sp.	1	0	0	5	0	0	0	0	0	2	8
Shear-Petrel	1	10	22	11	0	50	4	49	3	13	163
Storm Petrel sp.	0	0	0	0	0	0	0	0	2	0	2
Albatross sp.	0	0	0	1	0	0	0	0	0	0	1
Brown Booby	0	0	0	1	0	42	0	31	39	0	113
R.F. Booby	0	0	0	30	0	38	0	17	1	8	94
Masked Booby	0	0	0	12	0	0	0	0	0	0	12
Booby sp.	0	0	0	7	0	7	0	1	2	0	17
Noddy Tern	0	0	207	639	0	550	0	330	2405	21	4152
Hawaiian Noddy Tern	0	0	20	50	0	40	0	0	100	0	210
Blue-gray Noddy	0	0	0	0	0	0	0	0	431	0	431
Sooty Tern	0	0	39	285	0	4	0	29	65	8	13
Fairy Tern	0	0	0	0	0	0	0	7	21	0	28
Tern sp.	0	0	3	0	0	0	0	0	0	0	3
R.T. Tropicbird	0	0	6	2	0	5	8	2	0	0	23
W.T. Tropicbird	0	23	1	0	0	0	0	1	0	0	6
Tropic sp.	0	3	2	1	0	3	1	1	0	0	11
Great Frigate	1	0	9	2	0	6	0	2	0	0	20
Shorebird sp.	0	0	0	1	0	0	0	0	0	0	1
Total	73	45	455	1643	0	1591	25	994	4908	131	9865

* 18th of August was spent in Nawiliwili Harbor

** Observations were ended at 1200 on August 23

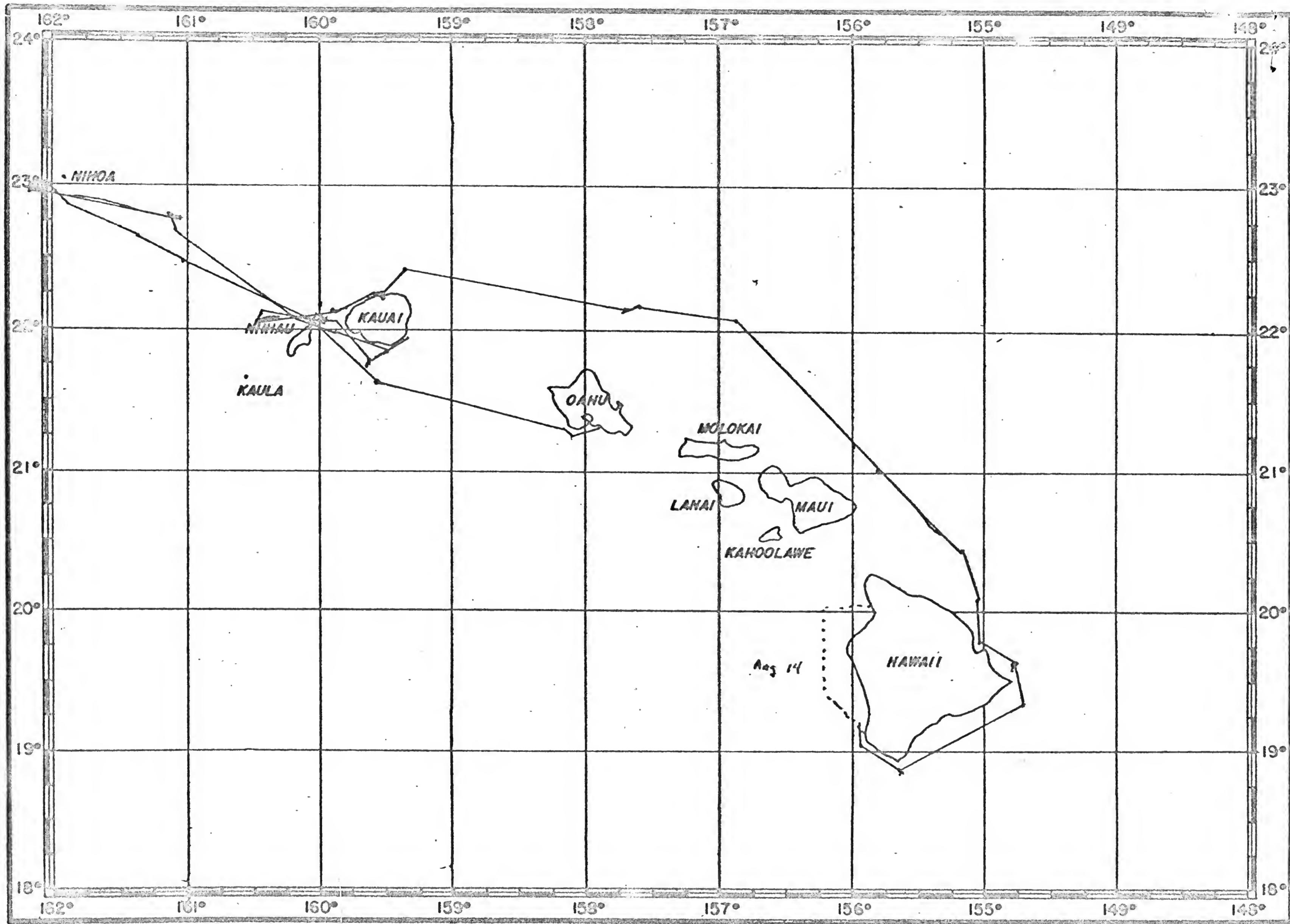
TABLE III
OCEANOGRAPHIC DATA

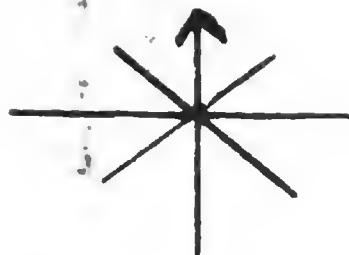
Date	8-14-64	Surface Temp.	27.4
Time	1638	Wind Speed	23 mph
Position	20° 00' N, 156° 02' W	Wind Direction	50°
		Barometer	1013
		Weather	03
		Sea	1
		Visibility	9
		Dry Bulb	27.2
		Wet Bulb	23.3
		Cloud Type	8
		Cloud Amt.	4
Date	8-19-64		
Time	1010		
Position	22° 08' N, 159° 48' W	Surface Temp.	21.6
		Barometer	1018
		Weather	03
		Sea	3
		Visibility	9
		Dry Bulb	26.7
		Wet Bulb	23.3
		Cloud Type	8
		Cloud Amt.	4
Date	8-21-64		
Time	1009		
Position	22° 02' N, 160° 05' W	Surface Temp.	26.7
Flock No.	I	Barometer	1013
		Weather	02
		Sea	2
		Visibility	9
		Dry Bulb	26.9
		Wet Bulb	23.1
		Cloud Type	8
		Cloud Amt.	3

TABLE III (cont.)

Date	8-21-64	Surface Temp.	26.1
Time	1720	Barometer	1012
Position	22° 29' N, 160° 42' W	Weather	02
Flock No.	II	Sea	1
		Visibility	9
		Dry Bulb	25.8
		Wet Bulb	21.7
		Cloud Type	8
		Cloud Amt.	2

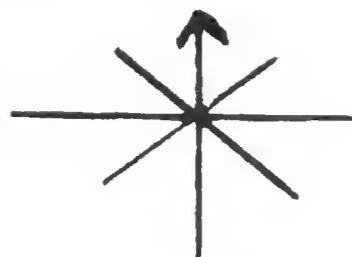
Date	8-22-64	Surface Temp.	26.2
Time	0810	Barometer	1016
Position	22° 29' N, 162° 08' W	Weather	02
		Sea	2
		Visibility	9
		Dry Bulb	26.1
		Wet Bulb	22.6
		Cloud Type	8
		Cloud Amt.	3





DATE Aug 14, 1964
Pg. # 10

time	species	#	dir.	hgt.	remarks	loc.
1232	Begin Observations					
1255	Wedgetail	1	W			
1322	Wedgetail	1	W			
1355	Porpoise?	1	W	around boat		
1401	Wedgetail	1	NW			
1405	Wedgetail	1	NE			
1408	Wedgetail	2	NE			
1410	Wedgetail	1	W			
1413	Wedgetail	1	NW			
1415	Wedgetail	2	N			
1416	Bulwer's Petrel	1	N			
1424	Wedgetail	2	N			
1430	Passed through a fairly large school of porpoises, about 30					
1458	Great Frigate	1	N			
1502	Wedgetail	1	⑥			
1508	Wedgetail	1	N			
1515	Shear-Petrel	1	E			
1526	Bulwer's Petrel	1	NE			
1547	Bulwer's Petrel	1	N			
1549	Wedgetail	1	⑥			
1600	Petrel sp	1	N		Either a Leach or a Harcourt or a Bulwer's. long wings and	
1610	Wedgetail	1	N			
1625	Shearwaters - school Flock heading toward it - + he capt. says Turns bottom least of bird school,					
1638	in Flock 40 30 Dark and light wedge tails but 4 dark. 30	10			5 shearwaters dwindle around bird school.	
					Bulwer Petrels at outside 77 fish caught. Fish school moved around but, The skipjacks	
					were feeding on squid or flying fish	
1847	Bulwer Petrel	1	W			
1915	End Observations					



DATE 15 Aug 64
Pg. # 1

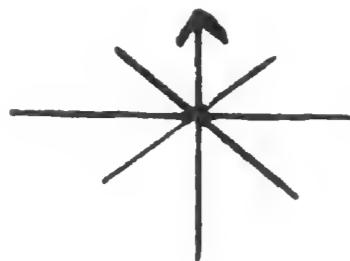
time	species	#	dir.	hgt.	remarks	loc.
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0630	Begin Observations					
Heading	in towards		Kauai (Keauhou)	(Keauhou)	for Bait fish	
0725	Wedgetail	2	NE			
0728	Wedgetail	1	S			in Kekakemua Bay - cliffs by Capt. Cook's marker.
0956	White T. Tropicbird	1	Landed on cliff base			
1001	W.T. Tropicbird	2	circling cliff			
1308	Bulwer's Petrel	1	SW			
1350	Tropicbird sp	3	SW		circling around a lava flow	
1354	Wedgetail	1	SW			
1406	Shear. Petrel	1	S			long way off. Probably a Wedgetail
1510	Wedgetail	2	NW			
1525	Wedgetail	1	S			
1532	Bulwer's Petrel	1	S			
1541	Wedgetail	2	SE			
1543	Shear. Petrel	1	SW			
1554	Wedgetails	4	SW			
1559	Wedgetail	1	SW			
1608	Wedgetail	1	S			
1610	Shear. Petrel	1	W			
1614	Shear. Petrel	1	SW		Seen by watch	
1620	Wedgetail	1	W			
1622	DRP 1 sp	2	W			
1630	Wedgetail	1	W			
1634	Shear. Petrel	2	W		Seen by watch	
1647	Wedgetails	2	E			
1651	Dark-rumped P	1	SE			
1655	Shear. Petrel	2	W		in the sun	
1657	Dark-rumped P	2	SE		Very close to ship	
1700	Wedgetail	1	SE			
1704	Shear. Petrel	1	W		Believe it was a DRP by its flight, but it was in the sun	
1726	Wedgetail	1	E			
1732	Wedgetail	1	E			
1835	Shear. Petrel	1	SE			
1840	End Observations					



DATE 16 Aug 64
Pg. # 1

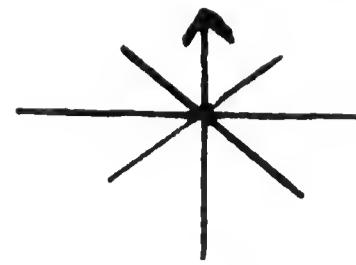
time	species	#	dir.	hgt.	remarks	loc.
0530	Begin Observations					
0618	Wedgetail	1	S			
0630	6 Noddy Tern	35	E	2	Travelling - low to water, but not feeding	
0634	Noddy Tern	5	E		Travelling	
0735	Shear-Petrel	1	W			
1110	Bulwer's Petrel	1	NE		at last, a bird is seen.	
1205	Wedgetail	1	NE			
1211	Wedgetail	1	NE			
1217	Shear-Petrel	3	NW			
1225	Bulwer's Petrel	1	NE			
1228	Noddy Tern	6	NE		Low to water, but travelling.	
1230	Bulwer's Petrel	1	NW			
1234	Noddy Tern	4	N			
1240	1 R.T. Tropicbird	3			Very high, seen with Terns	
1237	Noddy Tern	4	NE			
1241	Bulwer's Petrel	1	NE			
1245	Wedgetail	1	NE			
1247	Wedgetail	4	NW		Feeding	
	Bulwer's Petrel	2				
1250	Wedgetail	18				
	Noddy Tern	10			Feeding, Terns and Petrels very low to water.	
	Bulwer's Petrel	4				
1258	Wedgetail	10	NW			
	Noddy Tern	15			Feeding, Noddy's close to water	
	Bulwer's Petrel	4				
	R.T. Tropicbird	1				
1302	Tropicbird sps	1	seen by		Watch	
	Noddy Tern	1				
1304	Wedgetail	1	NW			
1305	Wedgetail	10+	NW	25+		
	Noddy Tern	5+	20	40	Feeding - The Terns are staying low to water, except for Sooty Tern	
	1 Sooty Tern	8				
	Bulwer's Petrel	5				
	R.T. Tropicbird	1				
					3 immature in flock at 1311, Fish moving too fast to catch	



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Pg. # 2

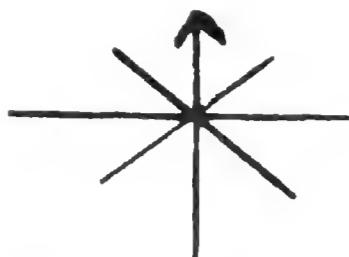
time	species	#	dir.	hgt.	remarks	loc.
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1337	out of flock.					
1414	Wedgetail	1	NW			
1417	Wedgetail	1	± 325			
	Noddy Tern	1	± 540	70		
	Frigate	2	3			
	Tropicbird sp	1				
	Sooty Tern	20				
1515	Wedgetail	1	NW			
1516	Wedgetail	3	NW			
1519	Wedgetail	4	NE		1 dark	
	Sooty Terns	6			2 immatura	Traveling
	Bonin Is P?	1				
1522	Wedgetail	3	NW			
1523	Noddy Tern	2	NW			
1525	Noddy Terns	35+	N		Low in water	Feeding
1527	Wedgetail	3	NW			
1531	Shear-Petrel	5	W		Traveling	
1541	Wedgetail	1				
	Caffrey break					
1550	Shear-Petrel	5	NE		seen by watch - from description it sounds like Bulwers.	
1603	Wedgetail	3	NW		Traveling	
1604	Tern sp	3	W			in the sun, from this height I would say Sooty Tern
1608	Shear-Petrel	1	W			
1610	Wedgetail	1	NW			
1611	Wedgetail	2	W			
1612	Bonin Is P	1	NW			
1615	Shear-Petrel	3	W			
1618	Wedgetail	2	W			
1622	Shear-Petrel	3	W			
1640	Wedgetail	2	N			
	White-necked P	1				
1658	Bonin Is P	1	N			
1659	Bulwers P	1	NW			
	Chow					
1800	Sooty Terns	5	N		Traveling	
1804	Wedgetail	2	N			



DATE 16 Aug 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
1809	Wedgetail	1	NE			
1814	W.T. Tropicbird	1	N		Sitting on Water	
1815	Frigate	6	N		Traveling - towards Hawaii	
1830	Shear-Petrel	1			All dark black except for light strip under wing, white area like a petrel, about the size of a small Bonin Is. P.	
1845	Wedgetail	1	NW			
1846	Wedgetail	1	W			
1848	R.T. Tropicbird	1	N			
1856	Wedgetail	1	W			
1858	Wedgetail	1	W			
1900	End observation	—	—	—	a good Day but long	



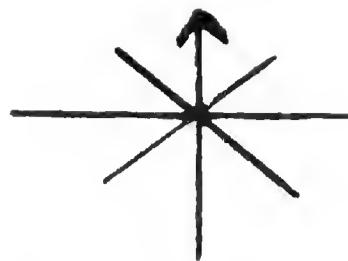
DATE 17 Aug 1964
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0535	Begin Observations					
0558	Wedge-tail	1	NE			
0610	D.R.P.	1	W		Rump dark.	
0623	Sooty Tern	1	E		immature - very mottled on breast	
0625	Tropicbird sp.	1	E			
0628	Wedge-tail	1	NW			
0645	R.T. Tropicbird	1	W			
0648	heard Sooty				Tern call, but can't find him	
0652	Shear-Petrel	2	NW			
0654	Wedge-tail	1	N			
0710	Wedge-tail	1	NE			
0715	Wedge-tail	2	NW			
0717	Wedge-tail	1	NW			
0719	Shear-Petrel	1	NW		Flew more like a D.R.P., sitting on water	
0720	W.T. Tropicbird	1	W			
0721	Wedge-tail	1	W			
0724	Wedge-tail	1	NE			
0745	Sooty Tern	1	W		immature - no adult present.	
0746	Wedge-tail	1	W			
0749	Shear-Petrel	1	W			
0758	Shear-Petrel	1	N			
0759	Wedge-tail	1	NW			
0800	Wedge-tail	1	W			
0802	Wedge-tail	2	W			
0806	Wedge-tail	2	NW			
1	Sooty Terns	12±3	W		Feeding	
	Wedge-tails	18±4				
	Petrel sp.?	5+				
0817	Wedge-tail	1	NW			
0820	Wedge-tails	2	W			
0824	Bonin Is P	1	W			
0845	Wedge-tail	1	W			
0900	Wedge-tail	1	W			
2	Sooty Tern	9	NE		Traveling like a small Puffin, & dark neck band.	
	Shear bird	1			Looked like a small Puffin, & dark neck band.	
0906	Sooty Tern	1	⑥		immature, breast mottled with white	



DATE 17 Aug 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
0915	Giving chase to flock.	in			lock at 0927	
0	Noddy Tern	50				
3	Sooty Tern	20				
	Wedgetail	65				
	{ Gull Tern					
	{ albatross	1				
	Frigate	1				
0930	Sooty Tern	3	NW			
1010	Wedgetail	30	NW		Feeding - starting after flock.	
4	Sooty Terns	12				
	Noddy Tern	40				
	marked Booby	5		6	Immature	
5	Wedgetail	10				
	Sooty Terns	6			Feeding	
1155	Sooty Tern	1	W			
1156	Shear-Petrel	1	W			
1157	Wedgetail	1	SW			
1201	Noddy Tern	1	SW			
1208	Bluew. Petrel	1	SW			
1254	Wedgetail	1	E			
1310	Wedgetail	1	SW			
1311	Shear-Petrel	3	S			
1314	Noddy Terns	2	N			
1315	Wedgetail	3	S			
1316	Wedgetail	1	W			
1317	Wedgetail	2	W			
1318	Wedgetail	1	SW			
1322	Wedgetail	2	S			
1331	Wedgetail	2	SW			
1333	Wedgetail	1	SW			
6	Heading toward flock					
	Wedgetail	20			Feeding	
	Noddy Tern	35				
	marked Booby	2				
	Sooty Tern	10				
1410	Wedgetail	1	NW			
1414	Wedgetail	1	⑥			



DATE 17 Aug 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
1418	Wedgetail	1	w			
1425	Noddy Terns	25				
	Wedgetail	20				
	Sooty Terns	5				
	Brown Booby	1				
1436	Wedgetail	1	w			
1442	Christmas Is 5	1	N			
1502	Noddy Terns	130	w			
	Sooty Terns	40			13 immatures	
	Wedgetail	90				
	Marked Booby	6			Feeding	
1545	Marked Booby	4				
	Noddy Terns	20	sw			
	Wedgetail	15			Feeding	
	Sooty Tern	5				
	R. F. Booby	8+				
1552	Wedgetails	40	±5	w		
	Noddy Terns	30	±5		Feeding	
	Sooty Terns	10	±2			
	Marked Booby	2				
	R. F. Booby	6				
1556	Noddy Tern	1	sw			
1557	Wedgetail	2	s			
1559	Wedgetail	1	s			
1600	Wedgetail	3	nw			
1604	Wedgetails	2	sw			
1605	Wedgetails	6	nw		100 not a flock	
1606	Noddy Tern	3	nw			
1610	Wedgetails	80±	sw		3 dark	
	Noddy Terns	145±				
	Sooty Terns	30				
	Booby sp.	2				
	Frigate	1				
	Marked Booby	8				
	R. F. Booby	12				
	Wedgetails	50	nothing	in water		
	Noddy Terns	90	"	" "		
1635	Noddy Terns	25	sw			
	Wedgetails	20			Feeding	
	Sooty Terns	12				
	Booby sp.	4				
	R. F. Booby	8				



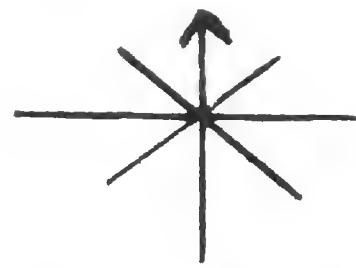
DATE 17 Aug 64
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
13	Wedgetail	20	NW			
	Noddy Tern	35				
	Sooty Tern	5				
	Booby sp.	3			Feeding	
1702	Wedgetail	3	SW			
1703	Bulwer's P	1	N			
1704	Wedgetail	2	S			
1705	Noddy Tern	2	NW			
1710	Noddy Tern	1	SW			
1720	Wedgetail	1	SW			
14	Wedgetail	10	±3	NW		
	Noddy Tern	15	±4			
	Sooty Tern	2			Travelling	
1722	Wedgetail	1	SW			
15	Wedgetail	15	SW			
	Noddy Tern	25				
	Black Booby	2			Feeding	
16	Wedgetail	12	SW			
	Noddy Tern	5	■■■			
	Sooty Tern	10	■■■		Feeding	
1740	Noddy Tern	4	SW			
1800	R.T. Tropicbird	1	⑥			
1812	Wedgetail	2	SW			
1821	Noddy Tern	2	NW			
1822	Bulwer's Petrel	1	N			
17	Wedgetail	4				
	Noddy Tern	3			Travelling	
1835	Shear Petrel	1	W			
1836	Wedgetail	1	NE			
1843	Wedgetail	2	S			
1846	Wedgetail	2	SW			
1851	Wedgetail	1	SW			
1858	Shear Petrel	2	W			
1859	R.F. Booby?	6			Travelling	
1900	End observations					



DATE 19 Aug 64
Pg. # 1

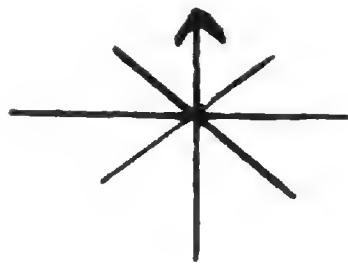
time	species	#	dir.	hgt.	remarks	loc.
18 0600	Begin Observations					
	Kauai in sight					
6900	Begin Observations on 19					
0901	Wedgetail	2	Honolulu Harbor			
0903	Wedgetail	1	E		dark	
0906	Wedgetail	1	W			
0908	Wedgetail	2	W			
1 { 0915	Wedgetail	8	W		Feeding	
6919	Wedgetail	3	W			
0920	Wedgetail	1	W			
0921	Wedgetail	2	E			
0923	Wedgetail	3	NW			
0926	Wedgetail	2	NW			
0932	Wedgetail	3	NE			
0936	Wedgetail	2	NW			
	Noddy Tern	2				
0948	Wedgetail	3	NW			
0950	Wedgetail	4	W			
0951	Noddy Tern	3	W			
2 { 1000	Noddy Terns	320 ± 60				
	Wedge-tailed Shearwater	2				
	Wedgetail	40	N		Feeding	
	Red Foot Booby	1				
1047	Tropicbird sp	1	NW			
1052	R.T. Tropicbird	1	SW			
1058	Tropicbird sp	2	SW			
3 { 1059	Wedgetail	6	SW			
	Noddy Tern	25 ± 5			Feeding	
4 { 1100	Wedgetails	4	N			
	Noddy Terns	5			Feeding	
1102	Wedgetail	2	N			
1103	Wedgetail	1	NW			
1104	Wedgetail	3	SW			
1106	Wedgetail	2	SW			
1107	Wedgetail	2	SW			
1108	Wedgetail	1	W			



DATE 19 Aug 64

Pg. # 2

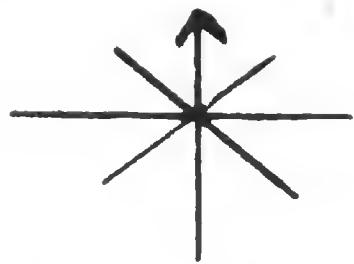
time	species	#	dir.	hgt.	remarks	loc.
11 13	R.T. Tropicbird	3	w			
11 14	R.F. Booby	2	sw			
11 17	Noddy Tern	1	w			
5 { 11 36	Wedgetail	6	sw			
	R.T. Tropicbird	1			Feeding	
11 37	Wedgetail	4	w			
11 38	R.F. Booby	2	s		Immature	
11 39	Wedgetail	3	s			
11 40	Noddy Tern	4	w		Not a flock	
	Wedgetail	3				
6 { 12 00	Wedgetail	25	0 50	w	3 Dark.	
	Noddy Tern	18			Feeding	
	Brown Booby	9				
12 15	R.F. Booby	1	w			
12 16	Wedgetail	1	w			
12 17	Wedgetail	4	sw			
12 20	Wedgetail	1	w			
12 32	Wedgetail	35	w		Not a flock.	
12 40	Wedgetail	25	w		Not a flock	
12 41	Brown Booby	2	w		swimming water	
7 { 12 50	Wedgetail	300	± 30	w	6 dark	
	Brown Booby	16			Feeding	
	R.F. Booby	14			6 immature	
	Sooty Tern	1				
8 { 13 40	Wedgetail	30	w		Feeding	
13 47	Wedgetail	3	s			
13 48	Wedgetail	4	w			
13 49	Wedgetail	2	w			
13 50	Harcourt's S.T.	1	w			
	R.F. Booby	2			Not a flock.	
	Wedgetail	10				
13 51	Harcourt's S.T.	2	w			
	Neuells S. Tern	1				
	Sooty Tern	1				
	Wedgetail	5				



DATE 19 Aug 64

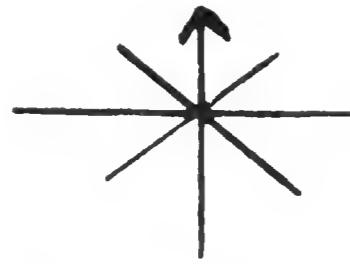
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
98	Wedgetail	12	W		3 dark, feeding.	
1410	Wedgetail	1	E			
1412	Wedgetail	3	W			
1416	Wedgetail	2	W			
1418	Shear-Petrel	3	W			
1419	Wedgetail	2	W		Dark.	
1420	Wedgetail	1	SW			
1428	Wedgetail	2	W			
1430	newells Shear	1	S			
1442	Brown Booby	1	SW			
	Wedgetail	3				
1445	Wedgetail	2	W			
1448	Shear-Petrels	4	SW			
1449	Brown Booby	1	⑥			
1458	Brown Booby	2	⑥			
1503	Brown Booby	1	⑥		incubating	
1504	A.F. Booby	2	N			
1506	Wedgetail	1	N			
1514	Newells Shearwater	1	N			
1516	Harcourts sp	1	N			
1517	Brown Booby	2	⑥			
1520	Bulwer's P	1	SW			
1522	R.F. Booby	1	SW			
1523	Sooty Tern	2	SW			
10	Shear-Petrel	15	SW		Feeding, probably Wedgetails	
1525	Wedgetail	3	W			
11	Shear-Petrel	20	W		Travelling, probably Wedgetails	
1530	Brown Booby	2	sitting in rigging			
1538	Wedgetails	3	SW			
1542	Newells Shearwater	1	S			
1547	Wedgetails	35	SW			
	Frigate	4				
	Booby sp	6				
	Noddy Tern	40				
					Feeding incubating	
1550	R.F. Booby	2				
1551	Newells S	1	S			



DATE 19 Aug 64
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
1553	Wedgetail	3	N			
1554	Wedgetail	2	S			
1555	R.F. Booby	1	N			
1558	Wedgetail	1	N			
1600	Wedgetail	1	S			
1602	Wedgetail	2	N			
1603	Brown Booby	3	sitting on water immatures			
1610	Newells S	1	N			
1612	Newells S	1	SW			
1615	Wedgetail	3	W			
1619	Newells S	1	N			
1622	Bulwers P	1	N			
1623	Wedgetail	2	NW		sitting on water	
1626	Wedgetail	2	N			
1638	Shear. Petrel	2	E			
1641	Wedgetail	1	E			
1655	Wedgetail	2	SE			
1657	R.F. Booby	1	NW			
1658	Bulwers P	1	NW			
1659	Shear. Petrel	1	NW			
1700	Wedgetail	1	NE			
1703	Wedgetail	1	NE			
1704	Newells S	1	NW			
1705	Brown Booby	1	NE			
1708	Brown Booby	2	NE		immature	
1710	Newells Shear	1	S			
1711	Wedgetail	1	NW			
1712	Wedgetail	3	N			
1713	Brn. Booby	1	S			
1718	Brn. Booby	3	SE			
1745	Wedgetail	1	S			
1748	Wedgetail	3	W			
1755	Newells Shear	1	E			
1805	Booby sp	1	E		immature	
1806	Wedgetail	2	W			
1809	Wedgetail	1	E		not a flock.	
1811	R.F. Booby	1	S			



DATE 19 Aug 64
Pg. # 5

time	species	#	dir.	hgt.	remarks	loc.
1814	Wedge-tail	1	E			
1817	Wedge-tail	3	N			
1818	Wedge-tail	2	N			
1819	Newells Shear	1	S			
1820	Wedge-tail	100 ± 20				
	R.F. Booby	8			5 immature	
	Brown Booby	3			2 immature	
1830	Frigate	2	E			
1832	Wedge-tail	1	E			
1834	Wedge-tail	4	N			
1835	Wedge-tail	2	N			
1841	Shear-Petrel	5	N		Traveling	
1843	Brown Booby	3	S			
1850	Wedge-tail	1	S			
1855	Wedge-tail	12	S	not a flock.		
1900	End Observations					



DATE 20 Aug 64
Pg. # 1

time species # dir. hgt. remarks

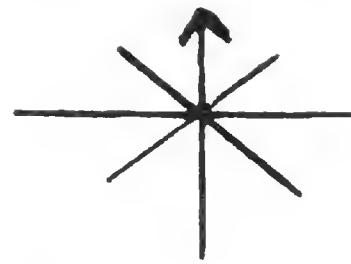
loc.

0530	Begin Observations			
Heading	into Saviliwili			
	Harbor			
0538	Shear. Petrel	1	SW	
0554	Wedgetail	1	SW	
0604	Shear. Petrel	3	E	
0628	Wedgetail	8	E	Travelling
0628	Wedgetail	2	E	
0632	Wedgetail	1	W	
0637	Tropicbird sp	1	NW	
0705	2 T. Tropicbird	8	on cliff	
0810	in port, E end			observations



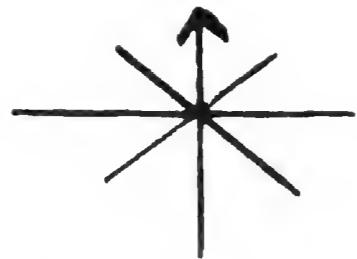
DATE 21 Aug. 64
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0630	Bogin O brevirostris (leaving port)	
0638	Wedgetail	3	W			
0645	Wedgetail	2	NW			
0650	Wedgetail	1	W			
0652	Bulwer's P	1	S			
0654	Wedgetail	3	W			
0659	Wedgetail	1	SW			
	Noddy Tern	2				
0710	Wedgetail	3	W			
0730	Wedgetail	1	S			
0731	Wedgetail	1	W			
0740	Wedgetail	1	SW			
0744	Wedgetail	1	SW			
0748	Wedgetail	1	N			
0749	Wedgetail	1	N			
0756	Wedgetail	1	W			
0758	S. Amer. Petrel	1	SW			
0759	Wedgetail	1	SW			
0803	Wedgetail	1	SW			
0804	Wedgetail	1	N			
0805	Wedgetail	1	N			
0809	Wedgetail	8	N		met w blocks	
0810	Bulwer's P	1	N			
0812	Wedgetail	1	S			
0813	Wedgetail	3	SW			
0817	Wedgetail	4	W			
0823	Wedgetail	3	SW			
0828	Wedgetail	2	N			
0829	Wedgetail	2	SW			
0833	Wedgetail	4	N			
1 0840	Wedgetail	10	SW		sitting on water Feeding	
2 0844	Wedgetail	6	SW			
0847	Wedgetail	3	SW		sitting on water - not doing much of anything	
0850	Wedgetail	3	W			
0852	Wedgetail	41	NW			
0853	Wedgetail	1	SW			
	Noddy Tern	1				
0854	Sooty Tern	1	NW			



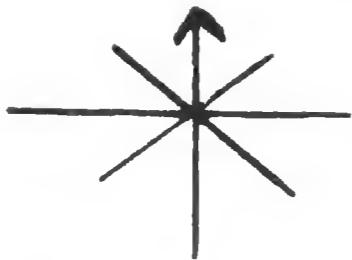
DATE 21 Aug 64
Pg. # 2

time	species	#	dir.	hgt.	remarks	loc.
0856	Sooty Tern	1	NW			
0859	Wedgetail	2	NW			
0900	Wedgetail	3	SW		sitting on water	
0901	Wedgetail	2	SW			
	Sooty Tern	1				
0902	Newells S	1	SW			
0903	Wedgetail	3	W			
0905	W.T. Tropicbird	1	N			
0906	Wedgetail	2	SW			
0911	Brn. Booby	1	SW			
0914	Wedgetail	2	NW		sitting on water	
0916	Wedgetail	1	SW			
0917	Shear-tail	3	W			
0918	Wedgetail	1	NW			
0924	Wedgetail	3	SW			
0928	Wedgetail	6	W		meta flock.	
0929	Noddy Tern	1	W			
0934	Noddy Tern	3	NW			
0935	Wedgetail	1	SW			
	Noddy Tern	1				
0936	Wedgetail	2	W		1 climb	
0940	Wedgetail	3	NW			
0949	Wedgetail	1	NW			
0950	Wedgetail	2	SW			
0954	Harcourts SP	1	SW			
0955	Bulwers P	1	SW			
	Wedgetail	3	W			
0957	Wedgetail	1	S		Dark.	
0959	Wedgetail	4	NW			
1001	Harcourts SP	1	W			
1002	Harcourts SP	4	SW			
1003	Wedgetail	50	60 dark			
	Noddy Tern	40				
3	Brown Booby	3				
	B.F. Booby	2	immature			
	Newells S	90t				
	Bonin Is P	5				
					<p><i>Notes: It flies something like a wedge-tail. It does not not fly as high, it stays lower, it is more maneuverable down on the water also. It appears to be able to take off the water faster than a wedge-tail also.</i></p>	



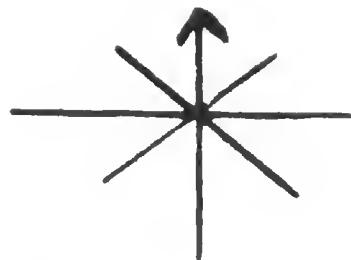
DATE 21 Aug 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
1028	Wedge-tails	13	w		Nata flock	
1032	Harcourts SP	1	w			
1033	Brown Booby	1	w		immature	
1038	Wedge-tail	4	sw			
1039	Wedge-tail	3	NW			
1040	Wedge-tail	50+	w		sitting on water, 2 dark.	
1042	Bulwers P	1	w			
1043	Wedge-tail	1	sw			
1046	Wedge-tail	3	sw			
1048	Wedge-tail	3	w		sitting on water	
1049	Harcourts SP	1	sw			
1050	Sooty Tern	1	NW			
1051	Wedge-tail	4	NW			
1052	Sooty Tern	12	NW		nata flock	
1100	Wedge-tail	3	sw			
1101	Wedge-tail	1	sw			
1102	Wedge-tail	3	NW			
1103	Wedge-tail	1	sw			
1104	Wedge-tail	2	w			
1105	Weddell S	1	w			
1107	Brown Booby	1	s			
1111	Wedge-tail	2	sw			
1113	Bulwers P	1	NW			
1114	R.T. Tropicbird	1	sw			
1115	Wedge-tails	3	sw			
1116	Sooty Tern	2	NW			
1117	Brown Booby	1	sw			
1130	Brown Booby	3	⑥	2	immature	
5	Wedge-tails	6	w			
1141	Brown Booby	2	⑥			
1146	Wedge-tails	4	w			
1147	Wedge-tail	3	sw			
1150	Wedge-tail	4	sw			
1151	R.F. Booby	3	NW			
1152	R.T. Tropicbird	1	NW			
6	Wedge-tails	15	sw			
	Sooty Terns	175				
	Brown Boobys	7				
	Frigate	1				
7	Wedge-tails	20				
	Sooty Terns	100				
					Feeding	
					Feeding	



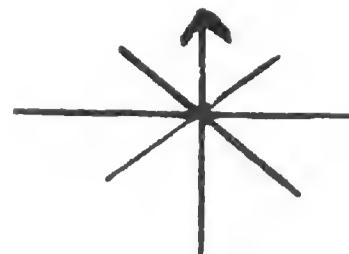
DATE 21 Aug 61
Pg. # 41

time	species	#	dir.	hgt.	remarks	loc.
1250	Wedgetail	3	NW			
1251	Woolly Tern	4	W			
1252	Wedgetail	2	W			
1254	BRN. Booby	2	⑥			
1255	Wedgetail	3	NW			
1256	Wedgetail	4	NW			
1257	Wedgetail	3	W			
1301	Wedgetail	1	W			
1305	Wedgetail	1	N			
8 1308	Shear. Petrel	20	±SW	W	probably Wedgetails, Feeding	
1310	Woolly Tern	1	SW			
1311	Bulwers P	1	SW			
1317	Wedgetail	1	W			
1318	Shear-Petrel	3	NW			
1319	Bron. Booby	1	⑥		immature	
1320	Wedgetail	1	N			
1321	Bron. Booby	1	NW			
1323	Wedgetail	1	W			
1326	Bron. Booby	1	NW			
1327	Wedgetail	1	NW			
1331	Wedgetail	3	NW			
1334	Wedgetail	1	W			
1339	Tropicbirdes	1	N			
1344	Harcourt's P	1	W			
1345	Wedgetail	1	N			
1348	Bulwers P	1	SW			
1353	Shear-Petrel	2	W			
1355	Bulwers P	1	W			
1359	Shear-Petrel	2	W			
1405	Bron. Booby	1	W		sitting in water	
1410	Wedgetail	2	W			
1415	Newells S	1	W			
1422	Bulwers P	1	W			
1427	Shear-Petrel	1	W			
1428	Wedgetail	1	SW			
1429	Wedgetail	3	W			
	Sooty Tern	1				
1430	Frigate	1	W			
1431	Bron. Booby	1	N			



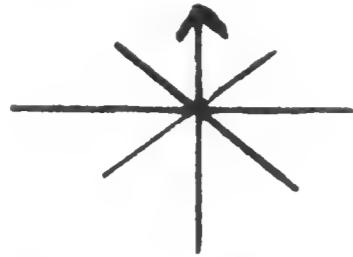
DATE 21 Aug 64
Pg. # 5

time	species	#	dir.	hgt.	remarks	loc.
1435	Wedgetail	1	N			
1450	Bulwers P	1	N			
1510	Wedgetail	1	N			
1520	Wedgetail	1	N			
1525	Noddy Tern	2	W			
1547	Wedgetail	1	W			
1555	Barn Booby	1	N			
1601	Newells S	1	N			
1607	Wedgetail	2	W			
1611	R.F. Booby	1	⑥			
1613	Bulwers P	1	W			
1614	Sooty Tern	1	N			
1616	Barn Booby	1	NE			
1617	Newells S	1	NE			
1619	Wedgetail	1	NE			
1621	R.F. Booby	1	W			
1622	R.F. Booby	1	W			
	5. Horn-Petrel	3				
1624	Booby sp	1	NW			
	5. Horn-Petrel	2	NW			
1627	Wedgetail	1	SW			
1631	Bulwers P	1	W			
1645	Bulwers P	1	W			
1647	Newells S	1	N			
1710	Wedgetail	20	W			
	Newells S	4				
	Sooty Tern	12				
	Fairy Tern	4				
	DR P	1				
	R.F. Booby	8 - 3 immatures				
	Barn Booby	3				
1906	R.F. Booby	1	⑥			
1905	Sooty Tern	2	W			
1907	Final observations					
1915	Newells S	6				
	Wedgetail	10				
	Fairy Tern	3				
	Sooty Tern	7				
1920	Final Observations					



DATE 23 Aug 64
Pg. # 1

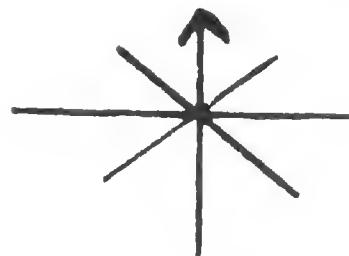
time	species	#	dir.	hgt.	remarks	loc.
0530	Begin Observations					
0550	Wedgetail	1	E			
0613	Wedgetail	2	SE			
0622	Wedgetail	1	SE			
0632	Wedgetail	1	SE			
0635	Shear. Petrel	2	E			
0637	Wedgetail	4	NE			
0638	Sooty Tern	1	NE			
0648	Wedgetail	1	E			
0658	Wedgetail	4	E			
0702	Wedgetail	2	SE			
	Sooty Tern	1				
0705	Wedgetail	1	SE			
0708	Wedgetail	3	SE			
0711	Patrol up?	2	SE		All All white underneath?	
0712	Wedgetail	3	SE			
0714	Wedgetail	1	E			
0715	Sooty Tern	2	NE			
0731	Wedgetail	1	NE			
0744	W. Noddy S	3	NW			
0748	Shear Shear-Petrel	1	E			
0809	Wedgetail	18	N		Feeding	
	Sooty Tern	4				
	Noddy Tern	20	S			
0817	Shear-Petrel	3	NE			
0830	Wedgetail	2	NE			
0843	Shear-Petrel	2	SE			
0850	Wedgetail	1	SE			
0858	Wedgetail	4	E			
0917	Shear-Petrel	1	E		5 S by water	
0938	Wedgetail	5	SE		water flock	
0942	Wedgetail	8	SE			
	R.F. Booby	8	SE			
0950	Common Noddy	1	SE			
0954	Shear-Petrel	4	S			
1015	Wedgetail	2	E			
1017	Banding P	3	S			



DATE 23 Aug 64
Pg. # 2

time species # dir. hgt. remarks loc.

1045	W. solitair	1	S	Dark	
1049	W. solitair	1	S		
1105	W. solitair	2	E		
1112	W. solitair	4	W		
1200	Endlicherianus			hgt changes w/ tides	



DATE 22 Aug 64
Pg. # 1

time species # dir. hgt. remarks loc.

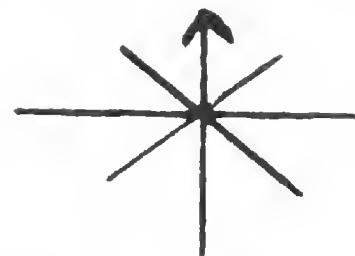
0550	Begin Observations				
0558	Wedgetail	2	SW		
0604	Bulwer's P	1	NW		
0611	Wedgetail	2	NW		
0616	Bulwer's P	1	W		
0617	Bulwer's P	2	NW		
0618	Wedgetail	4	W		
	Bulwer's P	5		Not a flock	
	Storm Petrel sp	2		Small dark, flew very erratic, long way out.	
0620	Wedgetail	50	W	Not a flock	
	Bulwer's P	37		may have been seen Sooty & storm Petrels	
0632	Sooty Tern	1	N		
0634	Wedgetail	12	N	Not a flock	
	Bulwer's P	5			
0635	Tern sp?	3	N	Looks like a miniature noddy Tern, flies with 3 bluegray noddy	
				constant wing beats, grey underneath	
0637	Wedgetail	8	NW	2 dark.	
	Bulwer's P	10		Not a flock	
	Sooty P	2			
0638	Wedgetail	19	NW		
	Bulwer's P	15		Not a flock	
	Sooty Tern	1			
0642	Wedgetail	9	NW		
	Bulwer's P	8		Not a flock	
0646	Wedgetail	87	NW	Not a flock, blue gray noddy	
	Bulwer's P	71			
0647	Tern sp?	2	NW	Head light, underneath light, wings & back dark Bill black and straight	
0650	Wedgetail	94	NW	Not a flock	
	Bulwer's P	82			
0652	Tern sp?	3	Blue gray noddy		
0658	Wedgetail	72	NW		
	Bulwer's P	41		Not a flock	
0659	Tern sp?	1	N		
0700	Wedgetail	98	NW		
	Bulwer's P	67		Not a flock	
	Tern sp?	4		Adonis think these are a Tern now B bluegray noddy	
	Sooty Tern				
	almost all birds			heading South	



DATE 22 Aug 64
Pg. # 2

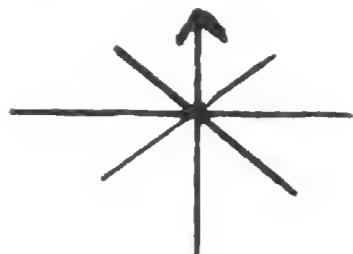
time	species	#	dir.	hgt.	remarks	loc.
------	---------	---	------	------	---------	------

0703	Wedgetail	72	NW			
	Bulwers P	54			Not a flock	
	Sooty Tern	2				
0704	Tern sp?	1	N		it might be small petrel ? - Blue grey noddy	
0707	Wedgetail	44	NW			
	Bulwers P	28			Not a flock	
	Fairy Tern	1				
Brn	Booby sp	1			immature	
0710	Wedgetail	32	NW			
	Bulwers P	18			not a flock	
0711	Brn Booby	3	⑥		immature	
0715	Wedgetail	54	NW		2 dark	
	Bulwers	20			not a flock	
	Brn Booby	1			4	
0717	Wedgetail	65	NW			
	Bulwers P	18			not a flock	
	Brn Booby	4			sitting in water, + 2 immature	
	55P	2				
0720	Wedgetail	15	NW			
	Bulwers P	4			not a flock	
0725	Wedgetail	19				
	Bulwers P	4			not a flock	
	Sooty Tern	1				
0728	Wedgetail	18				
	Bulwers 55P	2			not a flock	
	Brn Booby	7			4 immature	
0729	A. F. Booby	1			immature	
0734	Wedgetail	18	NW			
	Bulwers P	5			Not a flock	
	55P	3				
0749	Wedgetail	50	NW			
	Bulwers P	9			Not a flock	
	Sooty Tern	1				
0758	Sooty Tern	1	NW			
0810	Tern sp?	3	NW		Light on leading edge of wing, Despite Forked Tail, feet black - B.G. Noddy	
0812	Noddy Tern	5	SW			
	Wedgetail	8			Not a flock	



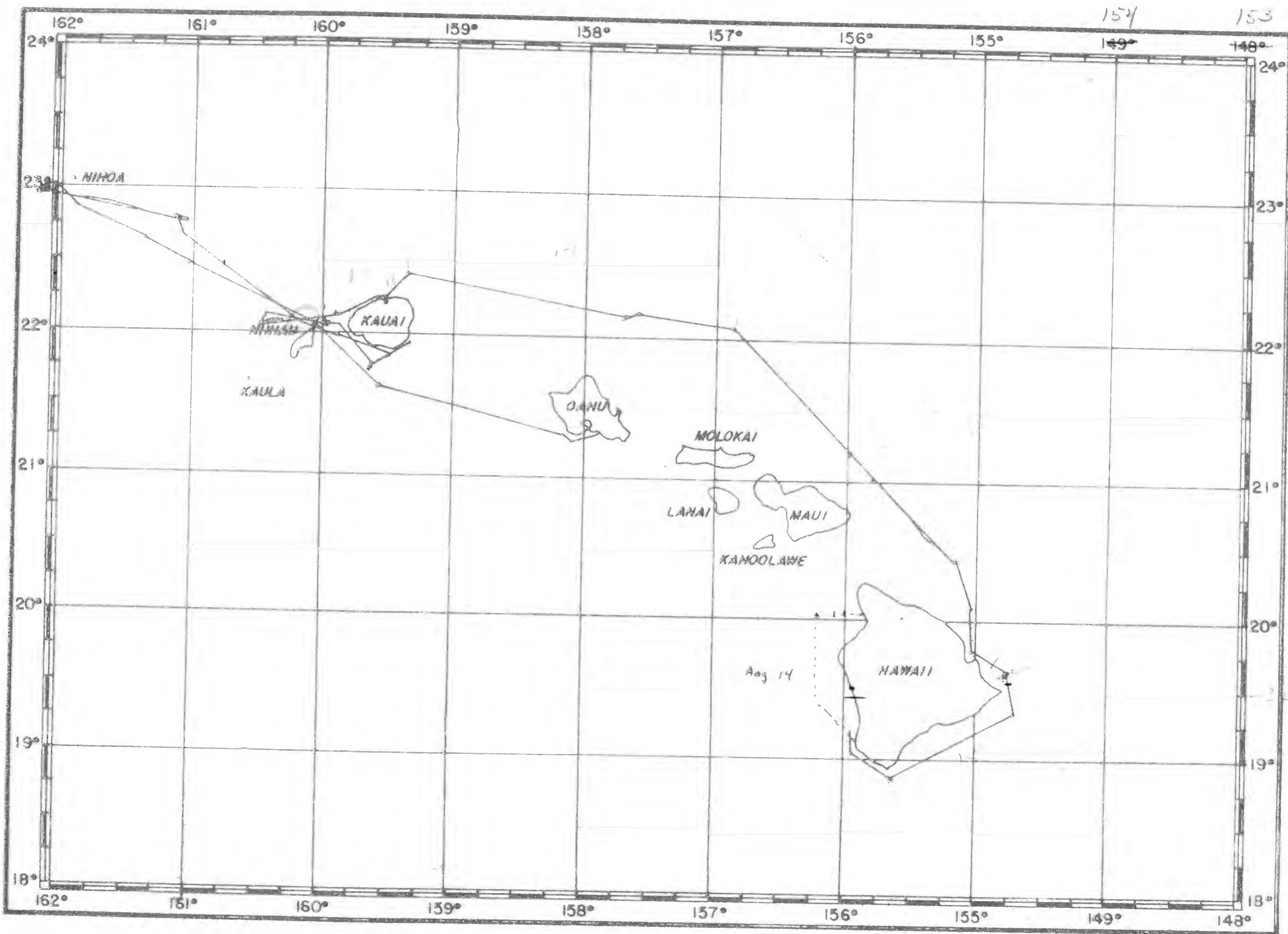
DATE 27 Aug 64
Pg. # 3

time	species	#	dir.	hgt.	remarks	loc.
0810	Wedgetail	390	± 50			
①	Noddy Tern	2500	± 200		Feeding	
	Sooty Tern	50				
	Fairy Tern	18	E	5		
	Tern sp	400	± 50		night shot dark tail blue grey noddy	
	Brown Booby	20				
	Out of flock	at 0955				
0958	Bulwer's P	3	N			
1002	Wedgetail	8	N	not a flock		
1005	Tern sp?	4	W		B.G. Noddy	
1009	Wedgetail	6	SE	not a flock		
	Brown Booby	3				
1010	Wedgetail	2	S			
1011	Wedgetail	1	SW			
1012	Wedgetail	1	SW			
1013	SSP?	1	SW			
	Bulwer's P	3	SW			
1014	Wedgetail	1	SW			
1015	Wedgetail	1	N			
1016	Wedgetail	6	N			
1017	Wedgetail	6	N			
1018	Bulwer's P	4	N			
1028	Bulwer's P	3	N			
	SSP	2	not a flock			
1031	Sooty Tern	4	W			
1037	Bulwer's P	4	E			
1039	Wedgetail	8	NE		not a flock	
	Sooty Tern	3	SE			
②	Tern. sp.	6	S		Traveling - These must be Immature Blue grey Nodlys, but where are the adults?	
	Bulwer's P	3	S			
	SSP?	1				
1115	Wedgetail	3	E			
1122	Brown Booby	1	N			
1136	Fairy Tern	1	N			
1148	Wedgetail	1	N			
1152	Wedgetail	1	NW			



DATE 22 Aug 64
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
1201	Wedgetail	2	E			
1204	Bulwers P	1	NE			
1205	Wedgetail	1	S			
1217	Wedgetail	2	E			
1222	Bulwers P	1	SE			
1235	Wedgetail	1	E			
1241	Bulwers P	1	N			
1242	Booby sp	1	E		immature	
1305	Shear-Petrel	1	N		seen by watch	
1315	Wedgetail	1	E			
1326	Wedgetail	1	E			
1328	Fairy Tern	1	N			
1348	Blue-gray Noddy	1	N			
1351	Blue-gray Noddy	1	NW			
1404	Bulwers P	1	E			
1409	Blue green Noddy	2	W			
1416	Wedgetail	1	E			
1417	Sooty Tern	1	E			
1428	Wedgetail	2	E			
1437	Wedgetail	1	E			
1445	Bulwers P	1	W			
1447	Bulwers P	1	NW			
1501	Bulwers P	1	W			
1530	Sooty Tern	1	⑥			
1531	Wedgetail	1	SW			
1604	Wedgetail	1	W			
1655	Shear-Petrel	1	W			
1710	Wedgetail	1	E			
1805	Wedgetail	1	S			
1815	Wedgetail	1	N			
1842	Sooty Tern	1	S			
1855	Shear-Petrel	1	W			
1900	End Observations					



Mr. Esterline - sheet made up in this office from minimal data

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 14 Aug 64

sls -

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
0600															
0700															
0800															
0900															
1000															
1100															
Kauai Hawaii	20-02	155-52													27/03
	20-02	155-54													27/03
1200	20-02	155-56													27 03
1300	20-01	155-58													27 03
1400	20-01	156-00													27 03
1500	20-00	156-03													27 03
1600	20-00	156-06													27 03
1628-1700	20-00	156-09													27 03
1700	20-00	156-12													27 03
1800	20-00	156-15													27 03
1900	20-00	156-18													27 03
2000	20-00	156-21													27 03
2100															
2200															
2300															
2400															

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 15 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
630	19-26	155-58													
728	19-26	155-58													
1	Kealakekua Bay														
0900	19-28	155-56													
1000	19-28	155-56											18	09	
1100	19-19	155-56											18	09	
1200	19-10	155-56											18	-09	
1300	19-01	155-54											14	09	
1400	18-57	155-52											14	09	
1500	18-53	44											05	109	
1600	18-57	36											05		
1700	19-01	28											05	11	
1800	05	20											05		
1900	09	12											05		
2000	13	155-04											05	11	
2100	17	154-56											05		
2200	19-20	48											35	11	
2300	19-28	49											35	11	
2400	36	52											31		

REMARKS:

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Position on
Aug 16

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 16 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	19-39	155-00													35 / 06
0200	42	155-05													35 / 6
0300	45	10													35 6
0400	48	15													34 06
0500	51	20													34
0600	54	25													34 "
0700	57	30													32
0800	20-00	35													32
0900	03	40													32
1000	6	45													32
1100	9	50													" "
1200	12	55													" "
1300	15	156-00													
1400	18	05													
1500	21	10													
1600	24	15													"
1700	27	20													"
1800	30	25													"
1900	33	30													"
2000	36	35													
2100	39	40													"
2200	42	45													"
2300	45	50													
2400	20-48	156-55													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 17 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20-51	157-00													32 / 06
0200	54	05													"
0300	57	10													"
0400	21-00	15													"
0500	03	20													"
0600	06	25													"
0700	10	30													"
0800	14	35													"
0900	18	40													"
1000	22	45													"
1100	26	50													"
1200	30	55													"
1300	34	158-00													"
1400	38	05													"
1500	42	10													"
1600	46	15													"
1700	50	20													32 / 06
1800	54	25													6
1900	58	30													6
2000	22-02	35													"
2100	06	40													"
2200	10	45													"
2300	14	50													"
2400	22-18	55													"

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 18 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	22-21	159-00													32 / 07
0200	24	05													32
0300	27	10													22 / 07
0400	24	15													22
0500	19	20													22
0600	22-15	159-25													22
0700	22-13	159-30													22
0800															22
0900															
1000															
1100															
1200															
1300															
1400															
1500															
1600															
1700															
1800															
1900															
2000															
2100															
2200															
2300															
2400															

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 19 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
0600															
0700															
0800															
0900	22-13	159-38	Nanalei Harbor Kauai												23/
1000	22-11	159-46	03	9	1018	26.7			4		3	21.6		23 W	
1100	09	52												23	
1200	8	56												23	
1300	7	160-01													
1400	6	06													26
1500	5	01													
1600	4	16													
1700	3	21													
1800	22-02	26												23	
1900	01	31												36	
2000	07	31												12	
2100	5	26												12	
2200	3	21												12	
2300	22-01	16												12	
2400	21-59	11												12	

REMARKS:

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WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 20 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.	
0100	21-57	160-06													12	1
0200	55	160-01													12	
0300	-52	159-56													12	
0400	21-51	49													12	06
heading into Nauiwaihi	-50	42													12	
	49	35													05	
0600	53	28													05	
0700	21-57	159-21	In Port (Nauiwaihi - Kauai)												05	
0800																
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 21 Aug 64

Sea

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
0600	21-57	159-21	Xavilam 61												23 110
0700	53	32													30 110
0800	56	42													30 10
0900	59	52													30 10
1000	22-02	160-02	02	9	1013	26.9			3		2	26.7			30 10
1100	04	07													32 10
1200	08	12													32 09
1300	12	17													32 09
1400	16	23													32 09
1500	20	29													32 07
1600	24	35													32 08
1700	22-28	160-40	02	9	1012	25.8			2		1	26.1			32 08
1800	31	45													32 08
1900	35	50													32 08
2000	38	55													32 08
2100	40	161-00													32 108
2200	46	161-05													34 106
2300	48	161-07													34 106
2400	50	161-09													32 06

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

DATE 22 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	22-51	161-17													29 / 08
0200	52	25													29
0300	53	33													29
0400	54	40													29
0500	55	48													29
0600	56	56													29
0700	57	162-00													29 /
0800	22-58	162-06	02	9	1016	26.1			3		2	26.2			05 / 09
0900	23-00	162-02													13 /
1000	22-55	161-58													13 / 09
1100	50	51													13
1200	46	44													13
1300	42	37													13
1400	38	30													13
1500	34	23													13 / 17
1600	30	16													13
1700	26	09													13
1800	22	161-02													13
1900	18	160-55													13 / 1
2000	14	48													13
2100	10	40													13
2200	22-04	30													13
2300	22-02	20													13
2400	22-00	160-10													13

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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Rev. 4-9-64

DATE 23 Aug 64 - Honduras

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA CLIMATOLOGICAL DATA

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21-57	160-04												14	07
0200	54	159-58												14	
0300	51	52												14	
0400	48	159-46												14	
0500	45	40												14	
0600	41	34												14	
0700	38	28												14	
0800	35	22												14	
0900	31	16												14	
1000	28	10												14	
1100	25	159-04												14	
1200	21-21	157-58												05	11
1300	21-18	157-53												05	
1400															
1500															
1600															
1700															
1800															
1900															
2000															
2100															
2200															
2300															
2400															

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS